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ABSTRACT

An overview of the NovaNET Computer System, a time-sharing networking computer system for the delivery of computer-based education, is followed by a description of the SYS IV system, which is used for management and record keeping in mathematics, reading, language arts, and spelling curricula. A description of lesson design features follows, along with data on curricula validation, recommended implementation guidelines, and information on communications and security features of the system. Appendices include information on the scope of the SYS IV curricula for basic skills students; an annotated list of individual lessons available in reading (reading comprehension, pacing, content area reading, and finding the main idea of a passage) and language arts (capitalization, comma rules, contractions, direct objects, double negatives, irregular verbs, paragraph proofreading, possessives, pronoun case, subject recognition, subject-verb agreement, synonyms, antonyms, and verb recognition); and lists of additional lessons useful for basic skills education in the areas of reading, vocabulary, mathematics, and consumer education. (GL)

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novaNET SM

BASIC SKILLS LESSONS FOR MIDDLE SCHOOL, HIGH SCHOOL AND ADULT BASIC EDUCATION STUDENTS

June 1988

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OVERVIEW OF THE novaNET SM COMPUTER SYSTEM

University of Illinois novaNET is a time-sharing, networking computer system developed specifically for the delivery of computer-based education (CBE). novaNET encompasses most of the same body of materials as its predecessor, the University of Illinois PLATO R system. The Computer-Based Education Research Laboratory (CERL) has been a leader in CBE for over 25 years.

There have been several curriculum projects and thousands of lessons on various PLATO systems throughout the world. Each project has been developed with a specific need in mind, and with specific funding, administration, and lesson design philosophy. One of these projects at the University of Illinois has resulted in the development of a Basic Skills Curriculum that has proven to be very successful. Its success is based on a combination of lessons and a student management system called *SYS IV* TM.

THE SYS IV MANAGEMENT SYSTEM

The CERL Courseware and Applications (CCA)* Group at the University of Illinois has served GED (high school equivalency) students since 1975 in diverse environments ranging from prisons to public schools. In response to classroom experiences and needs, the group has developed:

a) curricula in mathematics, reading, and language arts; and

b) SYS IV, a flexible, powerful, easy-to-use management and recordkeeping system.

The curricula developed for SYS IV operate as an automatic package capable of pretesting students, assigning and delivering appropriate lessons, and then posttesting them on the material. Teachers may override the system at any point. Thus, a teacher can handle many students with minimum effort, yet still be able to modify the curriculum for individual students.

Although SYS IV was designed to handle curricula having multiple instruction units with pre- and posttesting in each, the system also can deliver a variety of other arrangements (single lessons, sequenced lessons, indexed lessons, and so on), all with or without testing.

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* The CERL Courseware and Applications Group was formerly known as the PLATO Education Group (PEG).

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The PLATO R system is a development of the University of Illinois.
PLATO R is a trademark of Control Data Corporation.

MANAGEMENT AND RECORDKEEPING

Several levels of management occur within SYS IV Curricula, including management within lessons, management between lessons, management between tests and lessons, and maintenance of a summary record for each student. Within lessons, various strategies are used to ensure that the student achieves mastery. For instance, in a practice situation, the computer may keep track of the items a student answers incorrectly and reinsert those items into the item queue for review at various intervals. Often, a pool of items is available similar to the original item. Each variation of the original item requires the student to perform the same task, ensuring that a student can answer each item-type and has achieved mastery of the concept before he leaves the lesson. Another feature enables the computer to remember where a student stopped and to start him again at that point.

Once a student completes a lesson, the lesson sends this information to the router, which then decides what the student should do next. Depending on the design of the curriculum, the router may assign a new lesson, move the student on to the next concept within the same topic, give him more practice on the same task, tell him to work on off-line materials, or require him to wait until the instructor reviews the information and decides on the student's next assignment.

SYS IV Curricula are capable of selectively assigning lessons based on how the student fared on specific portions of the test. This capability is used extensively in the Language Arts Curriculum. In addition, some lessons incorporate testing inside their structure, giving instruction only if a student begins missing items, and then, only on the item-types missed. This latter strategy is particularly useful for non-generalizable areas, such as irregular verbs. In this case, the testing and the lesson are done together.

Of course, SYS IV also maintains usage and progress records for the instructor. A history of each student's work, including current and completed topics, may be seen either on the terminal or on a hardcopy printout. Test items with a student's response and the correct response are kept for the most recent test, in case an instructor wishes to review the types of errors made and perhaps go over the test with the student.

The instructor is considered an integral part of the management system. In an easy-to-learn format, the instructor can add and delete students from the roster, change name spellings, make assignments, and review student progress. Lesson assignments may be altered at any point within a curriculum--if the instructor feels the student needs additional help, needs to skip ahead, needs to change topics completely, or simply needs more variety. One option allows a "reward" lesson after the student has worked for a given time period. Options are available for making assignments to an entire class at once, copying an assignment from student to student, copying a standard assignment from a template record (one with a preselected set of lessons), or assigning a single lesson or entire curricula.

After examining individual records, an instructor may want to look at summary statistics for the entire class. One of the utilities can do summary scans of various sorts, ranging from how many students completed a given topic last year to how many students failed a posttest between two given dates. This has proven useful in collecting information on the effectiveness of the program, on the scope of actual use of various topics, and for writing reports.

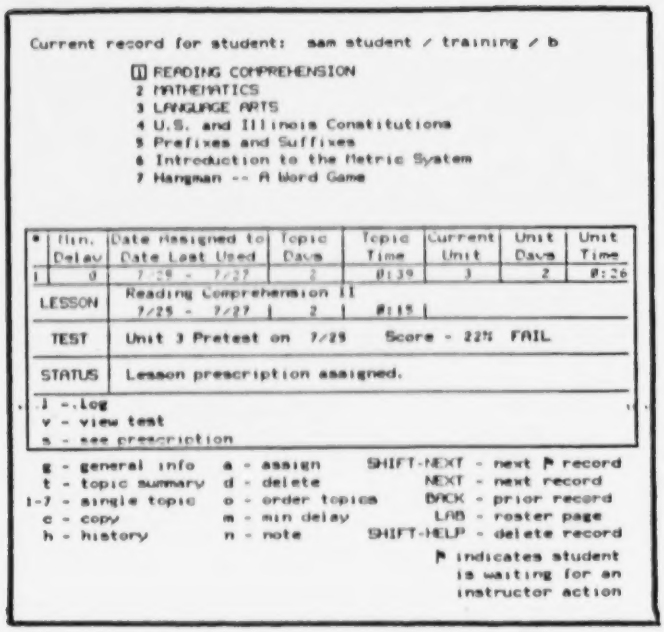


Figure 1. *A display an instructor might see while making a student assignment. This student has failed the* Unit 3 *pretest in the* Reading Curriculum, *and the teacher has assigned some lessons.*

Below are descriptions of SYS IV Curricula that have served thousands of students of various ages in prisons, high schools, middle schools, junior colleges, and alternative schools.

Mathematics

This curriculum consists of a sequence of 16 units, ranging from approximately fourth to eighth-grade level. Each unit has its own pre- and posttests. The curriculum covers operations with whole numbers, fractions, and decimals plus individually-assignable topics in percents, metrics, algebra, etc. Assembled from lessons developed for a National Science Foundation project, most lessons in the sequence adjust in difficulty on the basis of a student's performance and require mastery-level performance for completion. These characteristics, combined with the higher-level adjustment provided by instructor decisions and by the computer-managed sequencing, allow the curriculum to handle effectively the wide range of incoming abilities and skills encountered in remedial populations.

Incorporated into this sequence is an extensive set of paper-and-pencil materials designed to foster transfer of skills between media, to provide additional practice of math algorithms, and to allow more direct inspection of student work. Most sites have used these off-line materials. Some sites have chosen not to use the off-line materials and have been well-satisfied with only the on-line lessons. Other sites use the on-line lessons as supplementary materials in the context of various classroom activities. The sites that were evaluated used the combination of on-line lessons and off-line materials.

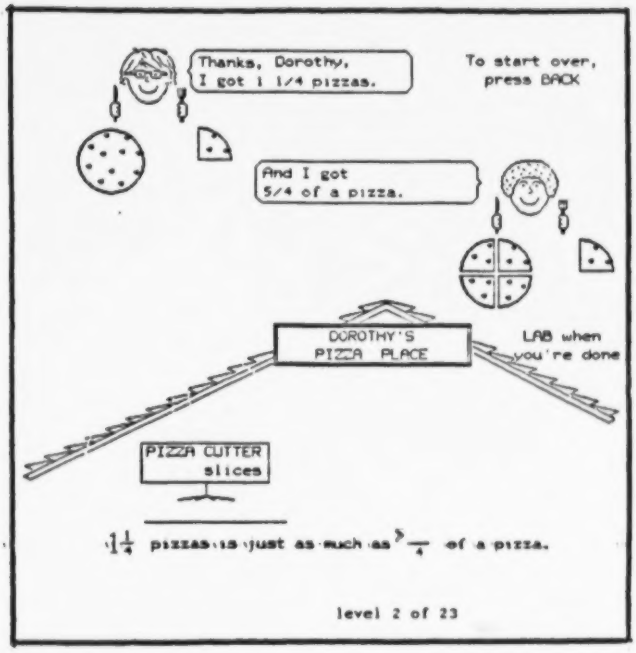


Figure 2. Pizza *is one of the more popular math lessons. The student is asked to run a pizza parlor and keep the customers happy by giving each one exactly the amount of pizza requested. Levels are controlled for simple fractions, mixed numbers, equivalent fractions, and so forth.*

Student results using the SYS IV Mathematics Curriculum have been excellent. Of the sites evaluated, four-fifths of the completing students spent less than 24 hours in math lessons, and a majority spent less than 16 hours, but the average student improved in math performance by about 1.7 grade levels. Results in this range have been replicated over many quarters.

Approximately 60 hours of lesson materials are available in the Mathematics Curriculum, although any one student will probably never see all of them. Recommended: (1) a minimum fourth-grade entry level; (2) student's time split approximately half-and-half between the on-line lessons and the off-line worksheets; and (3) 40- to 60-minute computer sessions, preferably 5 days a week, for 4 to 8 weeks (depending on a student's need).

(See Appendix A for a graphic description of the SYS IV Major Curricula.)

Reading

The SYS IV Reading Curriculum ranges from roughly fourth-grade level to tenth-grade level and covers a wide range of objectives. The ten units consist of three major strands of lessons integrated throughout the curriculum. One strand, the *Reading Comprehension I-IV* series of lessons, begins with simple *who*, *what*, *where*, *when* questions and moves up to complex paraphrasing. The second series of lessons covers content areas such as Biology, U.S. History, Forms of Government, and Economics. These lessons use a study-skills approach that questions the student as he reads, refers him back to the text to correct wrong answers, and asks him to picture relationships among concepts. The third strand of lessons, passages that are timed as the student reads them, encourages the student to pace himself--to read quickly but thoroughly enough to answer comprehension questions later.

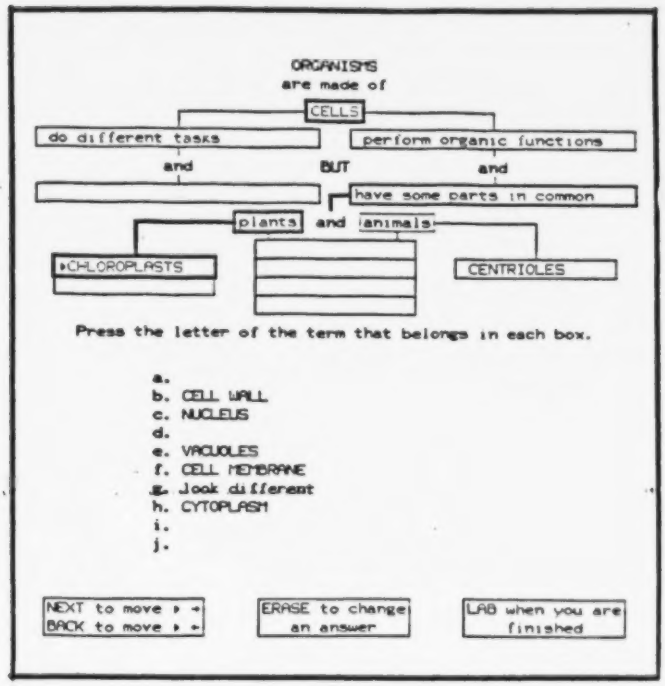


Figure 3. *One of the diagrams from* Cell Structure, *one of the series of lessons in* Content Area Readings. *Here, the student must demonstrate understanding of the relationship between the concepts by filling in the conceptual map.*

The Reading Curriculum lessons were designed, written, and programmed by CCA staff. All incorporate adaptive feedback and mastery-based criteria for completion. The curriculum is designed to use the *SRA Reading Laboratory III* as off-line materials. Assignment sheets are provided indicating which computer lessons are to be done and which SRA cards are to be read with which units. While most sites use both the on-line and off-line materials, some sites have used the computer lessons without using the paper-and-pencil materials. Some sites use on-line lessons in conjunction with other classroom work, but most sites use the lessons for main-line instruction.

Experience with the SYS IV Reading Curriculum has also been very positive. Results of standardized achievement tests have shown that students who complete this curriculum have an average gain of 1.3 grade levels for an average of 18 hours of on-line work. Off-line work has been estimated at 12 additional hours.

Approximately 70 lesson hours are available in the Reading Curriculum. Since instruction is individualized, the range of hours in instruction is widely divergent. Recommended: (1) a minimum of fourth-grade entry level; (2) approximately two-thirds of the student's time on-line and one-third off-line; and (3) 40- to 60-minute computer sessions, preferably 5 days a week, for 4 to 8 weeks.

Language Arts and Spelling

The eight-unit SYS IV Language Curriculum covers several topics at the middle school level, ranging from capitalization to verb recognition, from spelling to proper use of irregular verb forms. (For a complete list of CCA Reading and Language Arts lessons, see Appendix B.)

The use of grammatical terms is minimized; instead, the lessons use models and a usage approach. Specific off-line materials have not been developed to accompany the language lessons, although the lessons coordinate with several commonly-used language workbook series.

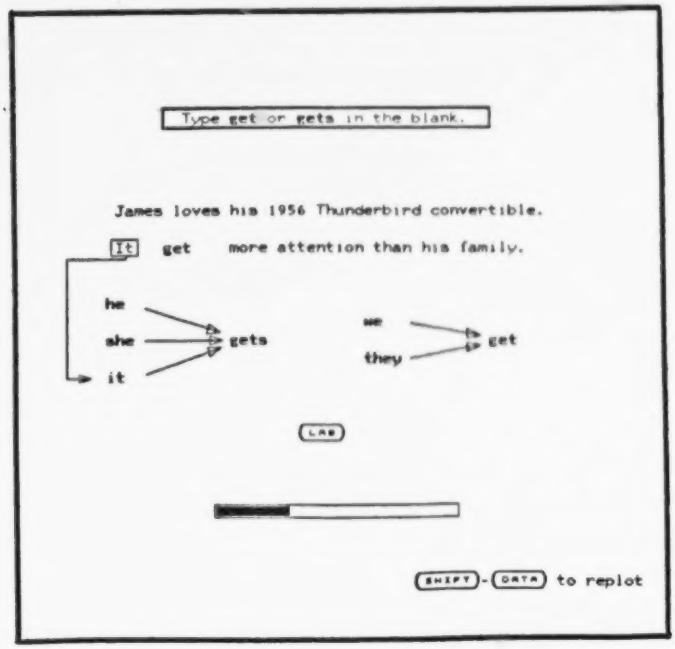


Figure 4. *One of the frames found in* Subject-Verb Agreement II. *The student has chosen the wrong verb form and is given feedback to help him remember the correct form next time. The bar at the bottom indicates how far the student has progressed through the lesson.*

Average student improvement using the Language Arts Curriculum has been 2.5 grade levels for 16 hours of on-line work. Average improvement using the Spelling Curriculum has been 1.6 grade levels for approximately 9.5 hours of on-line work.

Approximately 40 hours of instruction are available in the SYS IV Language Arts and Spelling Curricula. Recommended: (1) A minimum entry level of third-grade reading; and (2) 30-minute computer sessions, preferably 5 days a week, for 4 to 8 weeks.

SUMMARY OF CURRICULA CHOICES

The material above describes the main SYS IV Curricula currently in use. The SYS IV Management System, however, can also handle any of a number of types of lesson sequences, ranging from a simple free-choice index, through a forced sequence of lessons, to the sophisticated multi-unit curricula described above. The system can be made more or less "automatic" by inserting more teacher overrides or by letting the computer handle the decision points. For instance, one site has opted to signal instructors for help only when students fail a posttest, allowing the computer to make default lesson assignments. Most sites have the system signal instructors for help when students fail either pretest or posttest. A student is usually made to wait upon completing all lessons in a unit, to allow the instructor to make sure students have completed off-line materials before letting them move on.

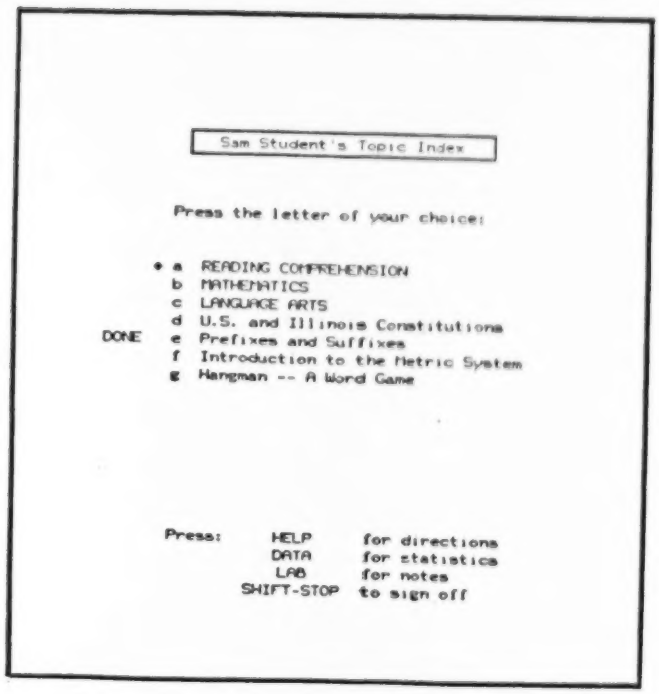

Sam Student's Topic Index
Press the letter of your choice:
• a READING COMPREHENSION
b MATHEMATICS
c LANGUAGE ARTS
d U.S. and Illinois Constitutions
DONE e Prefixes and Suffixes
f Introduction to the Metric System
g Hangman -- A Word Game
Press: HELP for directions
DATA for statistics
LAB for notes
SHIFT-STOP to sign off

Figure 5. *Student-choice index. The first three topics are multi-unit curricula. The next three topics are single lessons, one of which has been completed. The last topic is a game that does not appear until after the student has already worked for a set period of time.*

LESSON DESIGN FEATURES

All lessons designed by the CCA Group utilize a mastery-based approach to learning. The lessons use an adaptive feedback and review paradigm that will not allow a student to advance until he has mastered a given concept. Because of this mastery approach, information about lessons to the student and to the instructor does not include scores indicating how many items were right or wrong. Instead, the information shows which lessons a student completed, how long he spent in the topic, and how many calendar days it took him to complete the topic.

Note, however, that scores on *tests* are available. For the most recent test taken, the specific items seen and answered by a given student are available for teacher review. This is particularly useful, since test items are taken from a pool of items which can be randomized. In addition, answer choices for a given item are always randomized.

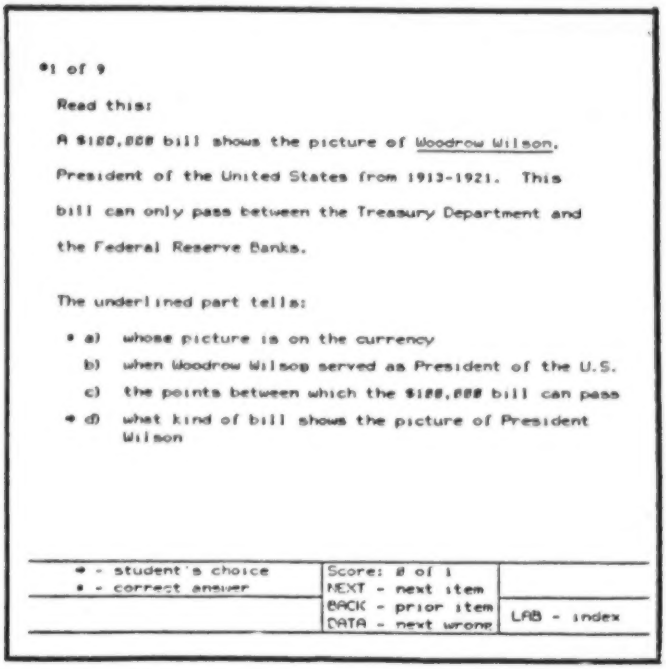

*1 of 9
Read this:
A $100,000 bill shows the picture of Woodrow Wilson,
President of the United States from 1913-1921. This
bill can only pass between the Treasury Department and
the Federal Reserve Banks.
The underlined part tells:
* a) whose picture is on the currency
b) when Woodrow Wilson served as President of the U.S.
c) the points between which the $100,000 bill can pass
→ d) what kind of bill shows the picture of President Wilson
→ - student's choice
* - correct answer
Score: # of 1
NEXT - next item
BACK - prior item
DATA - next wrong
LAB - index

Figure 6. *The teacher can review test items and see how the student's answer compares to the expected answer.*

CURRICULA VALIDATION

Over the past few years, the curricula have been evaluated using the *Test of Adult Basic Education (TABE)* on-line (with CTB/McGraw-Hill's permission). Having the TABE test on-line facilitates obtaining pre- and posttest data immediately before and after students use the curricula.

Results indicate an average gain in the range of 1.3 to 2.5 grade levels for about 18 hours of on-line work in each of the three principal curricula (54 hours for all three curricula). The range is about 10 to 40 hours of work for each curriculum; the gain, about 0.5 to 4.0 grade levels.

RECOMMENDED IMPLEMENTATION

The SYS IV Curricula were designed to be main-line classroom instruction, used in self-contained classrooms, utilizing both on-line and off-line materials. The population had not completed high school and was working toward a GED (General Education Diploma).

In prisons, for example, students are generally assigned to one teacher for either half-day or whole-day assignments, but they are expected to be reassigned every few weeks as they progress. In this setting, it is recommended that they work about half time on-line and half time off. Some students will need to spend more time in one area than others, and this self-contained classroom arrangement allows for the needed flexibility in scheduling math vs. reading vs. language arts activities. Most adult remedial students have different strengths and weaknesses. The full testing structure has proven helpful in directing a student to those tasks he needs to work on, reviewing him on others, and allowing him to bypass those he does not need to work on. This maximizes efficient use of student, instructor, and computer time. Under this arrangement, the number of terminals needed is half the expected student enrollment. Most prison classrooms have eight terminals.

In middle schools and high schools, classes are assigned by the 50-minute hour and by specific subject. Under these circumstances, students usually use the computer in connection with one area of study--math only, or reading only, and so forth. Usually the computer is used in a supplementary manner, rather than as main-line instruction. Sometimes the teacher does not want to waste precious computer time testing a student, when he knows that the student would benefit by using a specific lesson. In this case, teachers assign students a specific body of lessons without using the testing structure. This can be done easily with SYS IV.

For classrooms not using these materials as main-line instruction, sessions should be a minimum of 20 minutes, although longer sessions are more productive. A minimum of four terminals per classroom is recommended, allowing eight students to work each hour. This would give each student a turn on the computer every two to four days, depending on class size. Students working on-line less than once a week will work less effectively than those using the computer more frequently. It is more efficient to have a smaller number of students working more often for part of the semester than to have all of the students work once or twice each semester.

ADDITIONAL LESSONS

There are additional lessons that may be useful for the GED student, although they are not produced by the CCA Group and are not included in the SYS IV Curricula. These lessons have proven useful to students at our sites and are listed in *Appendix C* under *Additional Lessons Useful to the Basic Skills Student.* Many have been written by community college instructors for the same type of population. They have a variety of instructional strategies, and teachers are advised to review the lessons before assigning them.

ADDITIONAL FEATURES

COMMUNICATIONS

As a networking system, novaNET offers a wide spectrum of communications features. Among them are options for students to write notes to their instructors, for instructors to call for help from the site manager or the central office, for students and instructors to leave comments for the author about lessons they are viewing, and for staff members to communicate with each other, either directly or through a system of electronic mail. These communications features allow close communication between users and support personnel.

SECURITY

A wide spectrum of site management and security options is available. In addition, there is no large library of diskettes to store, manage, or protect. The lessons are stored in the main computer.

OTHER INSTRUCTIONAL MATERIALS

The SYS IV Basic Skills Curricula described above are among the most highly respected computer-based educational programs available anywhere. The SYS IV Management System is uniquely powerful and flexible, and the CCA curricula are both broad in scope and excellent in quality. In addition, the entire package has been tested and refined over a decade of user contact. It is now one of the most powerful and easy-to-use computer-managed instruction packages in existence.

Yet, the CCA materials represent only one of many curriculum and management options available on NovaNET. Prepackaged curricula in such diverse areas as foreign language instruction, physics, chemistry, biology, and other subject areas at the elementary, high school, and college levels--deliverable on one of several management systems--are also available.

To learn about and explore the range of instructional services novaNET provides, interested educators are cordially invited to visit the Computer-based Education Research Laboratory at the University of Illinois or their local distributor. Specially trained staff are on hand to provide a complete introduction to novaNET with a hands-on demonstration of the system's many features. If you decide to subscribe to NovaNET, trained staff will tailor curricula to your site's needs, and will provide installation, hardware and software maintenance, as well as instructor training and support.

FURTHER INFORMATION

APPENDICES

Appendix A lists vital information about the scope of the SYS IV Curricula for Basic Skills students.

Appendix B lists individual lessons in the Reading and Language Arts areas. These lessons are the ones used with the SYS IV Curricula. They are also available as independent lessons. An overview chart is given first, followed by a brief description of each lesson.

Appendix C lists additional lessons also useful to the Basic Skills student, functioning at the level of grades 3-12. Since there are so many lessons available, they have been grouped into areas and an approximate number of hours given.

Grade levels listed are not entry-exit levels, as much as levels within which these lessons might be useful. The hours are approximate, since students will spend more or less time in each lesson according to their needs. The number of hours across a line is an indicator of the quantity of materials included at that level.

PUBLICATIONS

The *Bibliography* at the end of this paper lists several publications that may be of interest for further exploration.

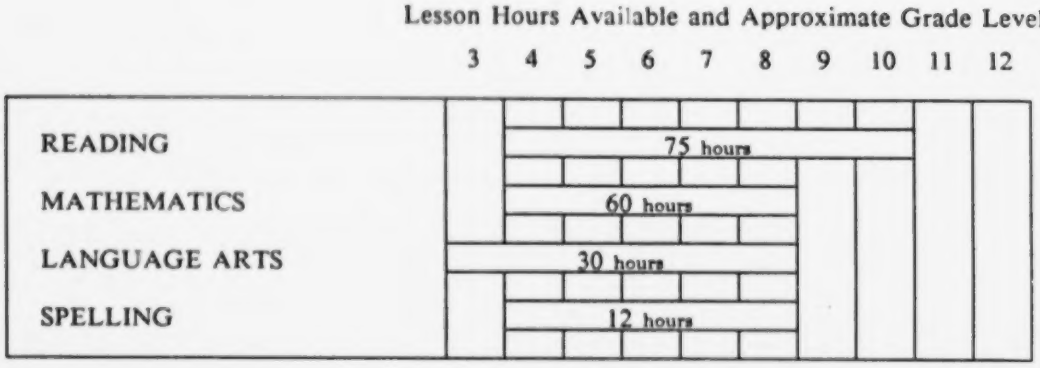
The lessons used in the SYS IV Mathematics Curricula, for the most part, are taken from the elementary math whole numbers and fractions curricula. These curricula and lessons are described in two CERL publications, *Description of PLATO Whole Number Arithmetic Lessons*, and *The Fractions Curriculum.*

The full range of materials available at all levels on the CERL system, is described in *CERL PLATO Lesson Catalog: Curricula and Utility Programs.*

The full range of options available through the SYS IV Routing and Management System is described in *Instructor Manual for the SYS IV Computer-Based Management System.*

An overall picture of the educational philosophy of the CCA Group may be found in the Siegel and Davis book, *Understanding Computer-Based Education.*

SYS IV MAJOR CURRICULA



*To derive maximum benefit, the student should be functioning within this grade level range.

READING:

Grades 4-10
Approximately 75 hours of available lessons
Pre- and posttesting in each of 10 units
Off-line materials: *SRA Reading Lab III*

MATHEMATICS:

Grades 4-8
Approximately 60 hours of available lessons
Pre- and posttesting in each of 16 units
Off-line materials: Worksheets developed by CCA

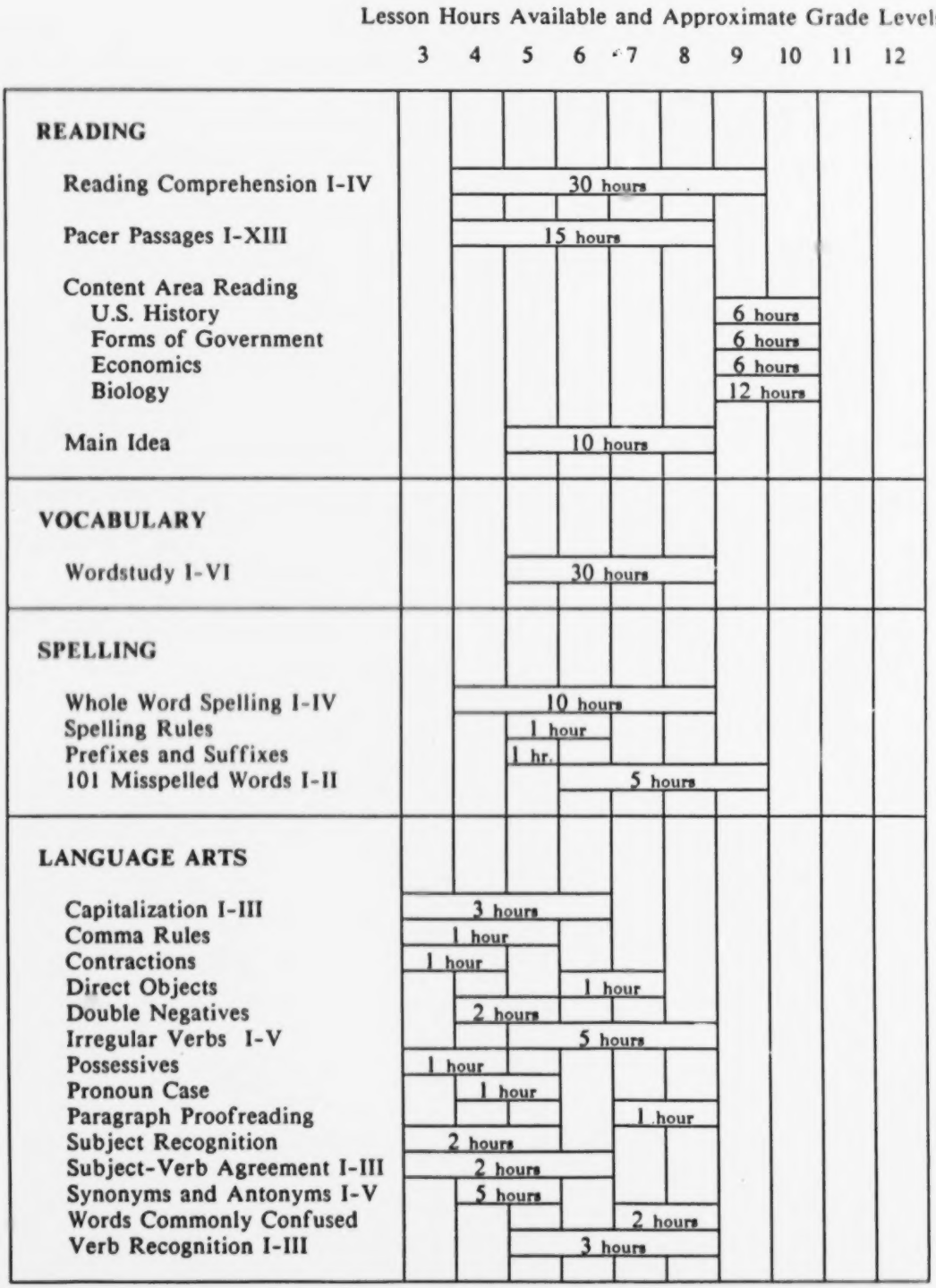
LANGUAGE ARTS:

Grades 3-8
Approximately 30 hours of available lessons
Pre- and posttesting in each of 8 units
Off-line materials: none

SPELLING:

Grades 4-8
Approximately 12 hours of available lessons
Testing within lessons
Off-line materials: none

INDIVIDUAL LESSONS AVAILABLE (CCA DESIGNED)



*To derive maximum benefit, the student should be functioning within this grade level range.

Appendix B-1

DESCRIPTIONS OF INDIVIDUAL LESSONS AVAILABLE
(CCA Designed)

READING

Reading Comprehension I-IV

Skills in information finding and paraphrasing are developed through the use of several question and answer strategies. Students can enter at one of four levels, progressing through ten parts at each level. *(Approximately 30 hours total, grades 4-9.)*

Pacer Passages I-XIII

A series of reading passages that are timed as the student reads them. The student must answer comprehension questions to gain credit for the lesson. The student is encouraged to read quickly, but thoroughly enough for understanding. Passages range from 100-500 words, followed by 4-10 questions. Each contains 4-6 passages, and covers a variety of topics in the sciences and the social sciences. *(Approximately 15 hours total, grades 4-8.)*

Content Area Reading

The following 25 lessons cover content areas using a study-skills approach that questions the student as he reads, refers him back to the text to correct wrong answers, and asks him to picture relationships between concepts. *(Approximately 30 hours total, grades 9-10.)*

Reading Lessons in U.S. History
1. U.S. Colonization to Independence
2. U.S. Confederation to Constitutional Convention
3. The Writing of the U.S. Constitution
4. The Civil War
5. Industrialization and the Growth of Cities

Reading Lessons in Forms of Government
1. Forms of Government
2. Capitalism, Communism, Socialism
3. Representative Democracy and Political Parties
4. Governmental Separation of Powers
5. The Election Process

Reading Lessons in Economics
1. Basic Economic Systems
2. Production and Consumption
3. Taxes
4. Free Enterprise and Government Regulation
5. Free Trade and Tariffs

Reading Lessons in Biology

1. Life Functions and Cells
2. Cell Structure
3. Reproduction of Single Cells
4. Reproduction of Male and Female Cells
5. Tissues, Organs, and Systems
6. Functions of the Blood
7. Growth and Metabolism I
8. Growth and Metabolism II
9. Genetics and Heredity
10. Plants and Photosynthesis

Main Idea

A series of lessons that helps the student learn to find the main idea in a passage. Emphasis is on concepts of categorizing, sorting, and attending to relevant vs. irrelevant information. *(Approximately 10 hours total, grades 5-8).*

VOCABULARY

Wordstudy I-IV

These vocabulary tutorials and drills were written for the adolescent and low-performing adult. Given a base word, the student is quizzed until he knows a meaning for that word. Then various forms of that base word are explored and used in sentences. *(Approximately 30 hours total, grades 5-8.)*

SPELLING

Whole Word Spelling I-IV

This series of lessons concentrates on the proofreading and spelling of high-utility words that cannot be taught by generalization. A game-type format is used for motivation and reinforcement. Spelling in context is emphasized. There are three groups of 10 words in each of the four lessons (120 words altogether). Words include *guitar, wealthy, embarrassing, forfeit, equator,* etc. *(Approximately 10 hours total, grades 4-8.)*

Spelling Rules

Lessons include practice with dropping the final *e* before adding certain suffixes as in *hope + ing = hoping,* doubling the final consonant when adding certain suffixes, as in *cap + ed = capped,* and changing the final *y* to *i* when adding suffixes, such as *glory + ous = glorious. (Approximately 1 hour, grades 5-6.)*

Prefixes and Suffixes

This lesson involves both the generation of words from parts and the recognition of prefixes, suffixes, and root words in larger words. The intent of the lesson is to teach students generalizations about morphological structures that are useful for spelling. *(Approximately 1 hour, grade 5.)*

101 Misspelled Words I-II

Proofreading drills on commonly misspelled words, such as *business*, *grammar*, *women*, *achievement*, *pitiful*, etc. Two words are shown, one of which is right and one wrong. The student must type the correct word. *(Approximately 5 hours total, grades 7-9.)*

LANGUAGE ARTS

Capitalization I-III

These lessons teach the most common rules for capitalizing words. Response conventions closely emulate the application of these skills in student writing. The first lesson includes *holidays*, *days of the week*, *cities*, *states*, and *the first word of a sentence*. The second lesson includes *the pronoun "I"*, *names of people and their titles*, *words related to countries*, *the first word of a quote*, and *titles of books*, *magazines*, and *works of art*. The third lesson consolidates and reviews the materials of the first two lessons. *(Approximately 3 hours total, grades 3-6.)*

Comma Rules

This lesson teaches basic rules for commas, including commas in *dates*, *cities and states*, *greetings and closings in letters*, *introductory adverbs*, and *nouns of direct address*. *(Approximately 1 hour, grades 3-5.)*

Contractions

This lesson provides practice on forming and breaking down a large number of common contractions. *(Approximately 1 hour, grades 3-4.)*

Direct Objects

This lesson teaches the concept of direct objects and drills the student on recognizing simple direct objects in sentences. *(Approximately 1 hour, grades 6-7.)*

Double Negatives

In this lesson students practice recognizing the inappropriate use of double negatives, as well as practice correcting such errors. *(Approximately 2 hours, grades 4-5.)*

Irregular Verbs I-IV

These lessons teach the correct usage of 20 of the most commonly misused irregular verbs. The lessons can be used in any combination. But if the student goes through them in sequence, verbs missed in earlier lessons will be reviewed in later lessons. *(Approximately 5 hours total, grades 5-8.)*

Paragraph Proofreading

In this lesson the student identifies, locates, and corrects a variety of punctuation errors. Several basic types of errors are covered, including *simple commas*, *periods*, *question marks*, *exclamation marks*, *quotation marks*, and *apostrophes*. Spelling and matters of diction are not covered in this lesson. *(Approximately 1 hour, grades 7-8.)*

Possessives

This lesson teaches two rules: (1) If the owner does not end in *s*, add *'s* to indicate possession and (2) If the owner does end in *s*, add only the ' to indicate possession. This is the simplest way to cover the largest number of correct plural forms. *(Approximately 1 hour, grades 3-4.)*

Pronoun Case

This lesson teaches appropriate use of pronouns such as *I/me*, *we/us*, etc. Grammatical knowledge of the concept *case* is not necessary. *(Approximately 1 hour, grades 4-5.)*

Subject Recognition

This lesson teaches the student to recognize words and phrases as subjects of sentences. *(Approximately 2 hours, grades 3-5).*

Subject-Verb Agreement I-III

These lessons cover a wide range of subject-verb agreement situations. The first lesson covers simple pronouns and high-frequency irregular verbs. The second lesson covers the agreement of pronouns with any verb. The third lesson covers agreement between nouns and noun phrases and any verb. Compound subjects and indefinite pronouns are also included. *(Approximately 2 hours total, grades 3-6.)*

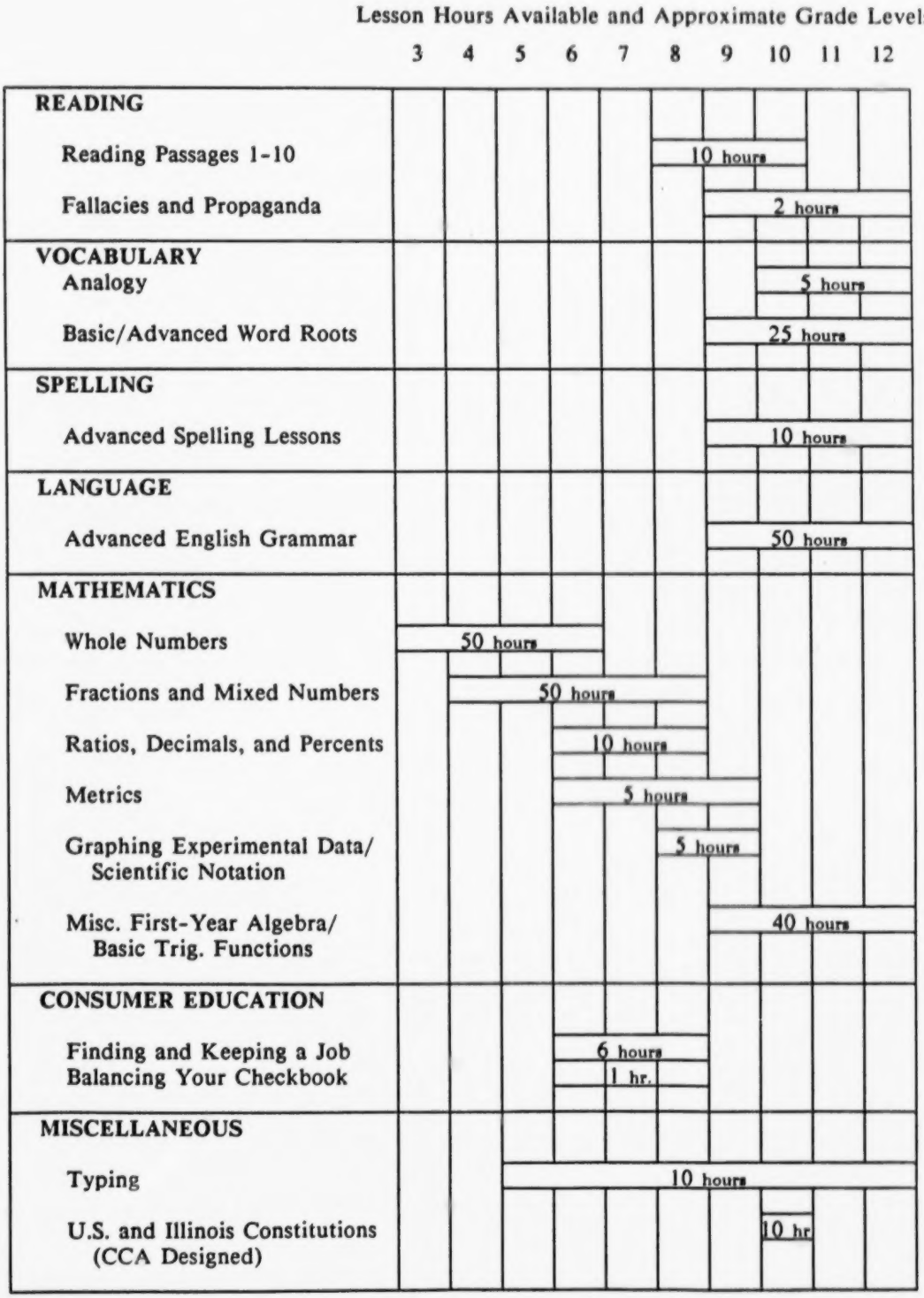
Synonyms and Antonyms I-V

This is a series of five lessons. Two lessons on synonyms teach the concept of synonym and then drill on several sets of commonly-used synonyms. Two lessons on antonyms teach the concept of antonym and then drill on pairs of words with opposite meanings. In the fifth lesson the student determines whether given word pairs are synonyms, antonyms, or unrelated words. These lessons are intended primarily as a vocabulary builder. *(Approximately 5 hours total, grades 4-5.)*

Verb Recognition I-III

A series of three lessons that teach students to identify verbs in sentences. Included are *simple action verbs*, *to be" verbs*, *other linking verbs*, and *verbs with modals and auxiliaries*. *(Approximately 3 hours total, grades 5-8.)*

OTHER LESSONS USEFUL FOR BASIC SKILLS STUDENTS WORKING AT GRADE LEVELS 3-12



*To derive maximum benefit, the student should be functioning within this grade level range.

Appendix C-1

DESCRIPTIONS OF OTHER USEFUL LESSONS FOR BASIC SKILLS STUDENTS WORKING AT GRADE LEVELS 3-12

READING

Reading Passages 1-10

A series of ten lessons written for students of English as a second language, but useful for basic skills students. Each lesson contains information on American history and social science topics. There are three sections to each lesson: first, a passage of six or seven paragraphs, with comprehension questions throughout the passage, then a section on vocabulary development, and finally a set of summary questions. *(Approximately 10 hours total, grades 8-10.)*

Topics include:

The North American Indians
Alexander Graham Bell
Higher Education in the United States
American Holidays
Growth of Higher Education in the U.S.
Dr. Martin Luther King, Jr.
U.S. National Parks
Modes of Transportation
Yellowstone National Park
Labor Unions

Fallacies and Propaganda

The first of these two lessons drills the student on recognizing errors in logic, such as *hasty generalization*, *begging the question*, *faulty cause*, *false dilemma*, and *faulty analogy*. The second lesson encourages the student to be aware of manipulative techniques such as *appeal to prejudice*, *joining the bandwagon*, *appeal to force*, and *appeal to pity*. *(Approximately 2 hours total, grades 9-12.)*

VOCABULARY

Analogy

This series of lessons gives the student practice in recognizing logical relationships and completing analogies. A wide range of analogies is covered in ten sections, including *relationships of part to whole*, *relationship by function*, *synonyms*, *antonyms*, *relative degree*, *relative parts of a sequence*, *purpose*, *special characteristic*, *grammatical function*, and *verbal precision*. Use of a dictionary while using this lesson is recommended. *(Approximately 5 hours, grades 10-12.)*

Basic/Advanced Word Roots

This series of 34 lessons helps the student develop greater vocabulary by drilling the student on various root words and their affixes. Each lesson is about 45 minutes long. The series begins with common English prefixes and suffixes, moves on to Latin roots and their derivatives, and then tackles some Greek roots and their derivatives. *(Approximately 25 hours total, grades 9-12.)*

SPELLING

Advanced Spelling Lessons

Several spelling lessons are available, written by different people. One of these deals with *ie* words, silent letters, and plural forms. Another deals with the recognition and correction of commonly misspelled words. A series of 6 lessons contains spelling drills based on concepts of root words, prefixes, and suffixes. *(Approximately 10 hours total, grades 9-12.)*

LANGUAGE ARTS

Advanced English Grammar

There are more than 50 lessons available in English Grammar and Usage, created for junior college students who need some additional help. These lessons are also appropriate for higher level Basic Skills students. Several authors are represented in this collection. *(Approximately 50 hours total, grades 9-12.)*

Areas covered include:

Parts of Speech	9 lessons
Sentence Structure	6 lessons
Verb Usage	11 lessons
Basic Punctuation	10 lessons
Noun Clauses, Verbals, etc.	5 lessons
Correct Word Use	3 lessons
Editing Skills	8 lessons
Referencing in a Term Paper	3 lessons

MATHEMATICS

Whole Numbers

A series of 80 lessons teaching concepts and algorithms of addition, subtraction, multiplication, and division. A number of game formats are used to encourage the student to use his skills in applications and problem solving. *(Approximately 50 hours total, grades 3-6.)*

Fractions and Mixed Numbers

Almost 100 lessons are available to teach major concepts about fractions and mixed numbers. They cover meanings of fractions and mixed numbers, equivalent fractions, adding and subtracting with like and unlike denominators, and multiplication of fractions. Attention is given both to understanding concepts and to extensive practice. Several game formats are used for teaching concepts, practicing, and reviewing. *(Approximately 50 hours total, grades 4-8.)*

Ratios, Decimals, and Percents

A series of 20 lessons. The first is a short introduction to the notation and terminology of ratios, expressing them in lowest terms. The next 13 lessons cover terminology of decimals, practice in converting between decimals, equivalent whole numbers, fractions, and mixed numbers, followed by algorithms for adding, subtracting, multiplying, dividing, and rounding off decimals. Several game formats are employed, including *Decimal Darts*, a number-line approach to decimal fractions. The final 6 lessons cover conversions between decimals, percents, and common fractions. A section on word problems with percents is also included. *(Approximately 10 hours total, grades 6-8.)*

Metrics

A series of 4 lessons introducing the student to metric measurements of distance, volume, and mass. The student begins by learning the general magnitude the various terms represent. For example, the student might be asked: *Is the more appropriate unit for measuring the distance between Chicago and New York centimeters or kilometers?* He then progresses to converting from one metric measure to another. Then he learns to convert between metric and English measures. *(Approximately 5 hours total, grades 6-9.)*

Graphing Experimental Data and Scientific Notation

This series includes 3 lessons about measuring weights on a spring, weights on a lever, and the concepts of direct and inverse variations. An additional lesson provides instruction in the use of a slide rule for multiplication and division problems, including instruction and exercises on the use of scientific notation. Another lesson teaches techniques of setting up problems through "unit analysis." *(Approximately 5 hours total, grades 8-9.)*

Miscellaneous First-Year Algebra Lessons

An assortment of over 50 beginning algebra lessons by various authors is available. *(Approximately 35 hours total, grades 9-12.)*

Topics include:

Signed Numbers (add, subtract, multiply, and divide)	7 lessons
Introduction to Exponents	1 lesson
Distributive Law and Collecting Terms	3 lessons
Evaluating Algebraic Expressions	1 lesson
Binomial Products and Polynomial Factoring	5 lessons
Beginning Algebra Word Problems	3 lessons
Algebraic Fractions	5 lessons
Finding and Simplifying Square Roots	4 lessons
Introduction to Sets	1 lesson
Introduction to Logarithms	2 lessons
Basic Concepts of Inequalities	1 lesson
Graphing Straight Lines	12 lessons
Solving Simultaneous Equations	9 lessons

Miscellaneous Basic Trigonometric Functions

A series of seven lessons providing an introduction to the basic concepts of angles, triangles, sine, cosine, and tangent. Instruction and practice on finding the missing sides or missing angles of a right triangle are given. One lesson includes story problems with trigonometry. The last lesson provides examples and practice in solving oblique triangles. *(Approximately 5 hours total, grades 9-12.)*

CONSUMER EDUCATION

Finding and Keeping a Job

There are twelve lessons that help the student think about how to locate a job, apply for it, and keep it. *(Approximately 6 hours total, grades 7-8.)*

Lesson topics include:

- Where to Look for Jobs
- How to Read the Want Ads
- How to Write a Resume
- How to Fill Out a Job Application
- Your Job Interview
- Job Survival Skills

Balancing Your Checkbook

This lesson provides a practical setting for the student to practice his decimal skills in keeping a balanced checkbook. *(Approximately 1 hour, grade 7.)*

MISCELLANEOUS

Typing

There are several typing lessons available. *Beginning Typing* consists of nine sections teaching the student to touch type. Other lessons drill the student on copy-typing lists of words. Others drill the student on copying entire paragraphs of text under timed conditions, maintaining records of the fastest typists. One lesson allows the student to learn alternative keyboards, such as the Dvorak keyboard. *(Open-ended, approximately 10 hours, grades 5 and up.)*

U.S. and Illinois Constitutions (CCA Designed)

This lesson drills and tests the student on topics included in the Illinois State Constitution Test, required of all high school graduates. Measured results indicate that 99.9% of the students who finish this lesson pass the Constitution Test. *(Approximately 10 hours, grade 10.)*

Topics include:

- U.S. Constitution
- U.S. Flag Code
- U.S. History and Early American Government
- Illinois State Constitution

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